

## STATUS IDENTIFIER FOR IDENTIFYING THE APPROVAL STATUS OF AN ELECTRONIC DOCUMENT

### FIELD OF THE INVENTION

5           The present invention relates to the field of systems and methods for the approval of electronic documents, and more particularly concerns a status identifier for use in such systems and methods, for properly identifying the approval status of a given electronic document.

### 10 BACKGROUND OF THE INVENTION

          Systems and methods for electronically approving and verifying the authenticity of electronic documents have enjoyed a rising popularity in recent years, with the increased use of electronic versions of documents, as opposed to paper versions, for official business. Descriptions of such systems and methods  
15       may for example be found in published international applications nos. WO 00/08541, WO 00/19295 and WO 00/19296, all to the present assignee. The result of the use of these systems or methods is an electronic document to which is attached in some manner, an indication that it is the same as approved by at least one user.

20           For the electronic documents approved through methods and systems according to existing prior art, two possible states exist. They are either valid i.e. this document is the same document that was approved) quite often this is illustrated by a checkmark or some other symbol that indicates validity), or invalid,  
25       i.e. that document has been modified since it was last approved (often illustrated by an X or some other symbol that indicates invalidity). However, this binary representation of the "approved" or "modified" state of a document is not adequate for a normal business process. For example, in the paper world, it is not unusual to have a document signed by a user and subsequently modified, the same or  
30       another user taking responsibility for the modification by putting his initials next to

it. There is currently no available procedure for the modification of approved electronic documents.

## 5 SUMMARY OF THE INVENTION

The present invention therefore provides an electronic document having a status identifier for identifying its approval status. The status identifier has the following possible states:

- 10 • a first state indicating that at least one section of the electronic document is as approved by an approving user;
- a second state indicating that modifications have been made to the at least one section of the electronic document as approved by the approving user; and
- 15 • a third state indicating that modifications have been made to the at least one section of the electronic document as approved by the approving user but that a modifying user has taken responsibility for these modifications.

Preferably, the electronic document may be provided with a plurality of such status identifiers, each associated with either a different approving user or a  
20 different section of the document.

In accordance with another aspect of the present invention, there is provided, in combination with a document approval system for the approval of an electronic document by at least one user, a status identifier for identifying an  
25 approval status of at least one section of this electronic document. The status identifier has a first state indicating that the at least one section of the electronic document is as approved by an approving user, a second state indicating that modifications have been made to the at least one section of the electronic document as approved by the approving user, and a third state indicating that  
30 modifications have been made to the at least one section of the electronic

document as approved by the approving user but that a modifying user has taken responsibility for these modifications.

The present invention further provides, also in combination with a document approval system for the approval of an electronic document by at least one user, a status identifier for identifying an approval status of the electronic document. This status identifier has:

- a first state indicating that at least one section of the electronic document is as approved by an approving user;
- a second state indicating that modifications have been made to the at least one section of the electronic document as approved by the approving user; and
- a third state indicating that it is unknown if the at least one section of the electronic document is as approved by the approving user, the third state of the status identifier being used for storage of the electronic document.

The present invention also provides improvements to a document approval system for the approval of an electronic document by at least one user, the system comprising a status identifier for identifying an approval status of at least one section of the electronic document. The status identifier has a first state indicating that the at least one section of the electronic document is as approved by an approving user and a second state indicating that modifications have been made to the at least one section of the electronic document as approved by the approving user.

In accordance with a first improvement to this system, the status identifier has a third state indicating that modifications have been made to the at least one section of the electronic document as approved by the approving user, but that a modifying user has taken responsibility for said modifications. In the case where the document approval system includes a plurality of status identifiers, each

associated with a different approving user, each of these status identifiers is provided with such a third state.

In accordance with a second improvement to the system, the status identifier has a third state indicating that it is unknown if the at least one section of the electronic document is as approved by the approving user.

Further features and advantages of the present invention will be better understood upon reading the following description of preferred embodiments thereof, with reference to the appended drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram showing an electronic document provided with status identifiers according to a preferred embodiment of the invention.

FIG. 2 (prior art) is a diagram showing the evolution of the status of a document modified after approval by a user in a prior art system.

FIG. 3 is a diagram showing the evolution of the status of a document modified after approval by a user in accordance with a preferred embodiment of the invention.

#### DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

The present invention provides two new states for an electronic document in the context of systems and methods for the approval of an electronic document.

FIG. 1 shows an electronic document 10 to which is attached a plurality of status identifiers 12. Each status identifier is preferably related to approval of the document by a given user. For simplicity, the description below will refer to the

approval of an electronic document, but it is understood that the present invention also applies to the case where approval of only one or a limited number of sections of a given electronic document is concerned.

The status identifiers each preferably have four possible states:

- a VALID state 14 indicating the electronic document 10 is approved by the related user;
- an INVALID state 16 indicating that the document 10 is different from that approved by the user;
- an unknown state 18 indicating that it is undetermined if the document 10 is as approved by the user; and
- a MODIFIED AND APPROVED (M&A) state 20 indicating that the electronic document 10 has been modified since approved by the related user but that another user (or possibly the same) has taken responsibility for the change.

Modified and Approved State:

This state is advantageous in that it provides visual feedback, making users aware that since a previous approval, someone has altered the document, but then took responsibility for the change. This feature is presently not encompassed by prior art, where in this situation only an invalid state is represented.

By way of example, FIG. 2 (prior art) shows the states of approval status identifiers for a given document that is modified after a first user has approved it, without the features of the present invention.

First the electronic document 10 is approved by user 1, setting the status identifier associated with this user SI1 to the state "valid". It will remain so as long as the electronic document stays the same as it was at the moment of approval by user 1.

Let's for example take the case where a user 2 modifies the electronic document after approval by user 1, therefore generating a modified electronic document 13. SI1 is therefore set to the "invalid" state since the document is not the same as approved by user 1.

When user 2 approves the modified document 13, a second status identifier linked to user 2 is set to valid. However, the first status identifier SI1 is still invalid, and there is no way of knowing if user 1 has ever approved the document in the first place.

Referring to FIG. 3, the same situation as described above is now repeated in the context of the present invention.

As before, the electronic document 12 is first approved by user 1, setting SI1 to the valid state, and then modified by user 2 to make the modified electronic document 13. SI1 is therefore set to the invalid state.

When user 2 approves the modified document, the second status identifier SI2 is set to the valid state as before. However, SI1 is also modified at this point, and is set to the new "modified and approved" state. It now reflects the fact that user 1 has indeed approved the electronic document 12, that it was subsequently modified to generate the current modified electronic document 13, and that someone (in this case user 2) has taken responsibility for the modifications made.

This state is absolutely necessary for standard business practices to move to the electronic domain. Traditionally, in the pen and paper world, when a person signs a document indicating their approval, a second person can freely alter the contents of the document which does not cross out or invalidate the first person's signature. They merely add their signature or initials to accept responsibility for the changes. The reason this works well in the paper world is because changes to a

5

10

Person Approving	Step	Partial visual Document State	of	Explanation
A	First person to approve the document	Approval #1 – VALID		Document is now considered authentic, in the same state since the person signed it
B	Second person simply adds their approval	Approval #1 – Valid Approval #2 – Valid		Document is the same document that Person A and B approved.
	A person makes a correction or change	Approval #1 – INVALID Approval #2 – INVALID		Document has been altered since person A and B approved it.
C	Takes responsibility for the change	Approval #1 – M&A by Person C Approval #2 – M&A by Person C Approval #3 – VALID		Mr. C has taken responsibility for the changes
	Another person changes or corrects the document yet again	Approval #1 – INVALID Approval #2 – INVALID Approval #3 – INVALID		Document is not in the same state as when the last person approved.

D	Takes responsibility for the change	Approval #1 – M&A by Person C Approval #2 – M&A by Person C Approval #3 – M&A by Person D Approval #4 – VALID	
E	Agrees with the document content and approved it.	Approval #1 – M&A by Person C Approval #2 – M&A by Person C Approval #3 – M&A by Person D Approval #4 – VALID Approval #5 – VALID	
F	Agrees with the document content and approved it.	Approval #1 – M&A by Person C Approval #2 – M&A by Person C Approval #3 – M&A by Person D Approval #4 – VALID Approval #5 – VALID Approval #6 – VALID	

### Unknown state

This state is particularly useful in cases where the software required to perform the validation of the document's integrity is not available or in the case where the software function to perform the integrity checking has not been invoked. This state is also referred to as a safe mode. This state can be represented by a question mark (?) or some other symbol that indicates an undetermined state. This is the ideal state to use when closing or storing a document into an archival situation – the reason being that an end user who has access to the document but not to the software to check the validity of the document, will only be able to access the document and not be able to incorrectly assume that the document is valid or not – it is undetermined until the verification software is run.



The present invention therefore provides an electronic document provided with a status identifier, having either one or both of the two new states described above. The electronic document may be combined to any appropriate document approval system. It may be advantageous to improve an existing document approval system by having it assign, to approved documents, a status identifier having those possible states. It is understood that an electronic document according to the present invention, may be provided with a plurality of status identifiers as described above, each associated with a different user, but that a single one of such status identifiers is sufficient for the scope of the present invention.

Although the present invention has been explained hereinabove by way of a preferred embodiment thereof, it should be pointed out that any modifications to this preferred embodiment within the scope of the appended claims is not deemed to alter or change the nature and scope of the present invention.